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THE FAUNA AND FLORA OF THE PAMIR.

Report on the Natural History Results of the Pamir Boundary Commission. By A. W. Alcock, M.B., Surgeon Naturalist to the Commission. With a List of the Plants, by J. F. Duthie, B.A., F.L.S., and a Notice of the Rock-specimens, by T. H. Holland, A.R.C.S., F.G.S. (Calcutta, 1898.)

FOR this useful addition to our knowledge of the Pamir plateau we are indebted to the enlightened policy of the Government of India, who, in attaching Mr. Alcock as naturalist to the Commission despatched in 1895 to demarcate the boundary between Afghan and Russian territory, followed the course adopted on several previous occasions, as when the late Dr. Stoliczka was sent as naturalist with the Yarkand mission in 1873-74, and when Dr. J. Anderson was added to the two expeditions to Yunnan in 1868 and 1875. The Indian Government have added to the value of the observations made by publishing the results, which comprise a few general remarks on the fauna, flora and geology, and a descriptive list of the specimens obtained.

The Commission left the valley of Kashmir on June 21, and returned to it on October 12, so that the journey occupied less than four months, whilst the time actually spent on the Pamir itself extended only from July 20 to September 16. This, however, is probably the best time in the whole year for zoological and botanical collecting at so high an elevation, and is certainly much better than April and May, when Stoliczka's collections were made in the same region.

The results, as Mr. Alcock points out, appear small, but this must be attributed to the poverty of the fauna and flora, every effort having been "made to get together as complete and representative a collection as possible." Six mammals, 37 birds, 4 fishes, 10 butterflies, and a few miscellaneous invertebrates were obtained, besides 105 phanerogamous and 10 cryptogamous plants. Four more mammals were seen, but no reptile nor batrachian was met with, despite careful search, and although specimens of both were obtained on the journey between Kashmir and the Pamir. All the fishes, except one loach, belong to the curious group of carps (the *Schizothoracinæ* of McClelland), with enlarged imbricate scales at the base of the anal fin. This group appears to be peculiar to Central Asia.

In the list of the animals obtained on the road between Kashmir and the Pamir, a very few forms with Indian affinities occur, for instance, a *Trochalopterum* among the birds, but still the great majority are Palæarctic species; even three earthworms are identified by Mr. Beddard as European. The Pamir fauna and flora show no trace of Indian affinities, but pertain strictly to the Central Asiatic phase of the Palæarctic (or Holarctic) region. At the same time, now that we know the fauna and flora of the Pamir plateau well, their most striking feature is the distinction shown from the animals and plants of Tibet. There is no great difference between the physical features of the two areas; they are both from 12,000 to about 18,000 feet in height (the Tibetan averaging rather the higher, but by not more than 2000 feet), and the two are completely united by the tableland of Western Tibet. Nevertheless very few of the animals or plants are identical, and the few that are appear to be forms of very wide range. Nor is this all; for so far as the mammalia, the best known and most important group, are concerned, the fauna of the bleak, barren plateau of Tibet appears to be considerably more numerous than that of the rather less bleak Pamir, despite the well-known rich pasture lands of the latter. Thus, taking the Ungulates alone, only two species, *Ovis poli*, Marco Polo's sheep, and *Capra sibirica*, the Asiatic ibex, are known from the Pamir; whilst in Tibet, the yak, Tibetan antelope (*Pantholops*), Tibetan gazelle, two if not three wild sheep (*Ovis hodgsoni*, *O. nahura*, and probably *O. vignei*), an ibex, and the kiang (*Equus hemionus*) occur, without taking into account *Budorcas*, two species of *Cervus* and the musk deer, which are found in parts of the plateau. The same difference is found in other mammalia; thus the golden marmot, *Arctomys aureus*, of the Pamir replaces *A. himalayanus* and *A. robustus* of Tibet, and *Lepus tibetanus* to the westward represents the *L. pallipes* and *L. hypsibius* of the great Eastern plateau.

As already stated the two plateaus, the Pamir and Tibet, are continuous, and are not separated from each other by any distinct elevation or depression. The cause of the marked difference in the fauna and flora needs explanation, and may not improbably be connected with the geological history of the two areas. It has been already shown that the specialisation of the Tibetan mammalian fauna probably indicates isolation during the latter portion of the Tertiary era, an isolation which can only be attributed to elevation. Whether it should be inferred that the elevation of the Pamir, which is believed to have been connected with the origin of the Himalayas, is of later geological date than that of Tibet, is a question that must be left to future geological explorers.

The geological observations in the present work are limited to petrological notes, the rocks found having been noted, and specimens brought away, which were examined by Mr. Holland. This proceeding, like the proverbial carrying away of a brick as a sample of a house, though apparently approved by high geological authorities, is extremely unsatisfactory, and it is to Mr. Holland's credit that he has been able to add one interesting fact, at all events, to previous observations. This is that certain rhyolites which are found on the Pamir are precisely the rocks that might be expected as the volcanic representatives of Stoliczka's "Central Gneiss," which Mr. Holland agrees with General McMahon in regarding as intrusive. This "Central Gneiss" forms the axis of the Himalayas and, as Stoliczka showed, it occupies an extensive area on the Pamir. It is curious that no allusion to Dr. Stoliczka's observations on the Pamir is to be found in Mr. Holland's notes.

In conclusion, it may be fairly stated that we are indebted to the Government of India and to Mr. Alcock for a very useful addition to the facts hitherto known as to the distribution of Asiatic animals and plants. Mr. Alcock acknowledges the assistance given by Mr. Finn in determining the birds collected, and by M. de Nicéville for the Lepidoptera. Mr. Duthie, who supplies the list

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of plants, has adopted the admirable plan of giving under each species a brief note of its range, a most valuable addition in a paper of which the importance is chiefly distributional. The plates consist of photo-etchings well executed in the Survey of India Office, and represent fishes, reptiles and crustaceans, the rock structure of a biotite granite, and a view of an *Ovis poli* skin on a wall of rough stones amongst small orchards. The last is so good a plate, that it is impossible to help regretting that a more congenial background has not been selected.

W. T. B.

SOCIOLOGICAL SCIENCE.

Outlines of Sociology. By Lester F. Ward. Pp. xii + 301. (New York: The Macmillan Company, 1898.)

MR. WARD'S little volume, with its clear thought and trenchant writing on more than one topic of current interest, will be welcomed by all students of sociology. It is a reprint of twelve chapters formerly contributed by the author to the *American Journal of Sociology* during the years 1895 to 1897. In the first six lectures, which bear the general title "Social Philosophy," Mr. Ward discusses the old question of the proper position of sociology in a systematic classification of the sciences. The general philosophical position adopted is that of Comte, but the author very properly restores anthropology and psychology to their lawful position in the scheme of the sciences between biology and sociology, and insists with great force upon the very special dependence of sociological on psychological science. The most interesting feature of this part of the book is Mr. Ward's able criticism of Mr. Herbert Spencer's favourite comparison of society to a huge biological organism. Following the lead of Prof. Huxley, he shows, by irresistible arguments, that it is not the whole biological organism, but only the nervous system which really corresponds to a society, and further, that society in its present state is at best a "very low form of organism."

> "The most extreme socialist would shrink from the contemplation of any such absolutism as that exercised by the central ganglion of even the lowest of the recognised Metazoa. In order to find a stage comparable to that occupied by society with respect to the central control of the functions of life, it is necessary to go down among the Protozoa and study those peculiar groups of creatures that live in colonies so adapted, that, while the individuals are free to act as they please within certain limits, they are still imperfectly bound together by protoplasmic threads to such an extent that they are in a measure subordinate to the mass thus combined, and really act as a unit or body."

When conscious co-operation of society, as a whole, for its own welfare supersedes sporadic individual effort, and not before will there be a real parallelism between social institutions and the nervous structure of the higher animals.

In the second part of the book, which is entitled "Social Science," Mr. Ward describes the gradual evolution of such a higher form of social structure. Social institutions at first grow up unconsciously under the pressure of the mere "struggle for existence." As intelligence progresses this stage of mere "genesis" passes into the higher stage, called by Mr. Ward "telesis"; unconscious growth gives place to the deliberate manufacture of institutions by conscious purposive action. Hitherto such conscious creation of social institutions has been the work of a few exceptional individuals, but in a higher stage of evolution we may expect it to take the form of "collective telesis," *i.e.* the deliberate co-operation of the community as an organised whole in the work of social amelioration.

Perhaps the most valuable part of Mr. Ward's book is that in which he discusses the differences between mere unconscious growth and deliberate constructive activity. It has been too much the fashion of sociologists in recent years to argue directly from biological analogies, forgetting that society is at least as much a machine as an organism, and that the presence in all but the lowest stages of social evolution of deliberate human purpose profoundly modifies the whole character of the evolutionary process. As Mr. Ward pithily phrases it, "the environment transforms the animal, but man transforms his environment," a remark which has an obvious bearing upon the application of evolutionary principles to the problems of ethics. Altogether the student who is not content with being told that society "evolves," but wishes to know how specifically social differs from merely biological evolution, will find Mr. Ward's last six chapters singularly luminous and suggestive. The get-up and typography of the book are generally worthy of commendation, but there are some ugly misprints of classical names.

A. E. TAYLOR.

OUR BOOK SHELF.

A Text-book of Botany. By Dr. E. Strasburger, Dr. Fritz Noll, Dr. H. Schenck, Dr. A. F. W. Schimper; translated from the German by H. C. Porter, Ph.D. With 594 illustrations, in part coloured. (London: Macmillan and Co., Ltd., 1898.)

THE "Text-book of Botany" issued from the famous institute at Bonn has met with such favour on the part of teachers and students, that it is a matter of surprise that the translation of it into English should have been so long deferred. However it is certain to be extensively used, as the subject is handled from a comprehensive standpoint, and the authors have succeeded in hitting the happy mean between a too elementary and a too advanced treatment.

It is the more to be regretted that, as it was passing through the press, the emendations and corrections which have some time ago appeared in the third German edition were not incorporated in the present volume, which seems based on the first edition in the original language. It is, for example, surprising, and to a student confusing, to find elaborate figures and descriptions of centrospheres in dicotyledonous cells on p. 61, when it is known that the author of this part of the book (Strasburger) has long ago abandoned his belief in their existence, and in the current German text expressly denies their presence in these plants. It may also be doubted whether the book gains at all in value by the somewhat poor coloured illustrations of certain examples of flowering plants, although in this the publishers are but following the original. If, however, they could see their way to reduce the rather high price of the book at the expense of these really useless luxuries, both its own circulation and the temper of the purchaser would improve. For it is not a little remarkable to find a work which in Germany can be bought for 7 marks, costing in its English dress 18s. The book is intrinsically so good that it is to be hoped

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